

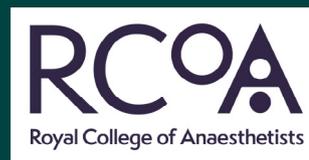


Royal College of
Obstetricians &
Gynaecologists

Coronavirus (COVID-19) Infection in Pregnancy

Information for healthcare professionals

Version 6: Published Friday 3 April 2020



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Summary of updates

Previous updates have been summarised in Appendix 2. New updates for this version of the guideline are summarised here.

Version	Date	Summary of changes
6	3.4.20	Throughout: References to the new RCOG guidance on (1) antenatal and postnatal services (2) antenatal screening (3) fetal medicine services (4) maternal medicine services and (5) self-monitoring of blood pressure, have been added throughout the document.
6	3.4.20	1.2: New resources signposted on current UK and international disease incidence.
6	3.4.20	1.4: Sentence reporting that there are 'no reported maternal deaths from COVID-19' removed because there was recently a possible maternal death reported in tabloid media. There is not any robust evidence to amend this statement or report confidently in the guideline.
6	3.4.20	3.2: Addition of new advice on screening birth partners for recent possible symptoms of COVID-19 when they attend the maternity unit. In addition, suggestion of information to give the birth partner about what is expected of them whilst they are in the hospital, to assist staff in reducing the risk of infection transmission and to assist with communication when birth partners accompany women into operating theatres.
6	3.4.20	3.4: Moved to section 3.2
6	3.4.20	3.5: New section on maternal mental wellbeing during the pandemic
6	3.4.20	4.1 The previous section 4.2 was repetitive of section 3.1 and so has been removed. Sections 4.2 onwards have been re-numbered.
6	3.4.20	4.3: Inclusion of the PHE case definition for COVID-19 testing, rather than referring readers to this through the link.
6	3.4.20	4.9: Updates to advice on PPE for Caesarean birth, to ensure that these are consistent with new PHE advice



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I. Introduction

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The following advice is provided as a resource for UK healthcare professionals based on a combination of available evidence, good practice and expert advice. The priorities are:

- (i) The reduction of transmission of COVID-19 to pregnant women.
- (ii) The provision of safe care to pregnant women with suspected/confirmed COVID-19.

Please be aware that this is very much an evolving situation and this guidance is a living document that is being updated as new information becomes available. We therefore suggest that you visit this page regularly for current advice.

On 20th March 2020, the UK Obstetric Surveillance System (UKOSS) launched a registry for all women admitted to UK hospitals with confirmed COVID-19 infection in pregnancy. Further information can be found [here](#).

This guidance will be kept under regular review as new evidence emerges. If you would like to suggest additional areas for this guidance to cover, any clarifications required or to submit new evidence for consideration, please email COVID-19@rcog.org.uk. Please note, we will not be able to give individual clinical advice or information for specific organisational requirements via this email address.

I.1 The virus

Novel coronavirus (SARS-CoV-2) is a new strain of coronavirus causing COVID-19, first identified in Wuhan City, China. Other human coronavirus (HCoV) infections include HCoV 229E, NL63, OC43 and HKU1, which usually cause mild to moderate upper-respiratory tract illnesses like the common cold, Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV).

I.2 Epidemiology

The virus appears to have originated in Hubei province in China towards the end of 2019. Within Europe, Italy is the country currently most affected. The [WHO coronavirus dashboard](#) has country by country information. WHO also published a [daily international situation report](#). The [total number of confirmed cases in the UK](#) is published by the Department of Health and Social Care, and is available in a [visual dashboard](#).

This situation, however, is changing rapidly and for the most up-to-date advice please consult national health protection advice. Health protection is a devolved matter and links to national guidance are available for [England, Wales, Scotland](#) and [Northern Ireland](#). Public Health England (PHE) and Health Protection Scotland (HPS) have been cited throughout this document; specific guidance from the other areas of the UK will be updated as they become available. At the time of writing, Public Health Wales are aligning with PHE on case definitions, assessment, infection prevention and control and testing. We will update this guidance if this changes.

I.3 Transmission

Most cases of COVID-19 globally have evidence of human to human transmission. This virus can be readily isolated from respiratory secretions, faeces and fomites. There are two routes by which COVID-19 can be spread: directly from close contact with an infected person (within 2 metres) where respiratory secretions can enter the eyes, mouth, nose or airways. This risk increases the longer someone has close contact with an infected person who has symptoms; and secondly indirectly by touching a surface, object or the hand of an infected person that has been contaminated with respiratory secretions and then touching own mouth, nose, or eyes. Healthcare providers are recommended to employ strict infection prevention and control (IPC) measures; as per local [Health Protection guidance](#).

Pregnant women do not appear more likely to contract the infection than the general population. Pregnancy itself alters the body's immune system and response to viral infections in general, which can occasionally cause more severe symptoms and this will be the same for COVID-19.

With regard to vertical transmission (transmission from mother to baby antenatally or intrapartum), emerging evidence now suggests that vertical transmission is probable, although the proportion of pregnancies affected and the significance to the neonate has yet to be determined. Two reports have published evidence of IgM for SARS-COV-2 in neonatal serum at birth.^{1,2} Since IgM does not cross the placenta, this is likely to represent a neonatal immune response to in utero infection. Previous case reports from China suggested that there was no evidence for this and amniotic fluid, cord blood, neonatal throat swabs, placenta swabs, genital fluid and breastmilk samples from COVID-19 infected mothers have so far all tested negative for the virus.³⁻⁶

The evidence above is all based on small numbers of cases. The situation may change and we will continue to monitor outcomes. MBRRACE-UK have just started centralised, real-time monitoring of affected mothers and their babies through [UKOSS](#), the data from which we will include in future versions of this guideline.

I.4 Effect on the pregnant woman

There is evolving evidence within the general population that there could be a cohort of asymptomatic individuals or those with very minor symptoms that are carrying the virus, although the incidence is unknown. Most women will experience only mild or moderate cold/flu like symptoms. Cough, fever and shortness of breath are other relevant symptoms.

It has long been known that, whilst pregnant women are not necessarily more susceptible to viral illness, changes to their immune system in pregnancy can be associated with more severe symptoms. This is particularly true towards the end of pregnancy. More severe symptoms such as pneumonia and marked hypoxia are widely described with COVID-19 in older people, the immunosuppressed and those with long-term conditions such as diabetes, cancer and chronic lung disease.⁷ These same symptoms could occur in pregnant women so should be identified and treated promptly. The absolute risks are, however, small.

At present there is one published case of a woman with severe COVID-19 who was admitted to hospital at 34 weeks' gestation, had an emergency caesarean birth for a stillborn baby and was admitted to the intensive care unit with multiple organ dysfunction and acute respiratory distress syndrome, requiring extracorporeal membrane oxygenation.⁸ A recently published statement by the Intensive Care National Audit and Research Centre in the UK reported, of the first 775 patients admitted to critical care settings with a diagnosis of COVID-19, one was pregnant and four recently pregnant (within the last six weeks).⁹ Other reported cases of COVID-19 pneumonia in pregnancy are milder and with good recovery.¹⁰

Individual responses to viral infection are different for different women and for different viruses. However, influenza and pregnancy provides a useful comparator: data from Australia have identified that there are significant increases in critical illness in later pregnancy, compared with early pregnancy.¹¹ In other types of coronavirus infection (SARS, MERS), the risks to the pregnant woman appear to increase in particular during the last trimester of pregnancy. In at least one study, there was an increased risk of preterm birth being indicated for maternal medical reasons after 28 weeks' gestation.¹²

I.5 Effect on the fetus

There are currently no data suggesting an increased risk of miscarriage or early pregnancy loss in relation to COVID-19. Case reports from early pregnancy studies with SARS and MERS do not demonstrate a convincing relationship between infection and increased risk of miscarriage or second trimester loss.¹³

There is no evidence currently that the virus is teratogenic. Very recent evidence has, however, suggested that it is probable that the virus can be vertically transmitted, although the proportion of pregnancies affected and the significance to the neonate has yet to be determined.^{1,2}

There are case reports of preterm birth in women with COVID-19, but it is unclear whether this was always iatrogenic, or whether some were spontaneous. Iatrogenic birth was predominantly for maternal indications related to the viral infection, although there was evidence of fetal compromise and prelabour preterm rupture of the membranes in at least one report.³



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2. Advice for health professionals to share with pregnant women

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2.1 General advice

As a pregnant woman the news that you were placed in a 'vulnerable group' by the UK Government on Monday 16 March 2020 may have caused you concern.

The evidence to date is that pregnant women are still no more likely to contract the infection than the general population. What is known is that pregnancy, in a small proportion of women, can alter the body's response to severe viral infections. This is something that midwives and obstetricians have known for many years and are used to dealing with.

What has driven the decisions made by officials is the need to restrict spread of illness because if the number of infections were to rise sharply, the number of severely infected pregnant women could rise and this could put them in danger.

Our general advice is that:

- If you are infected with COVID-19 you are still most likely to have no symptoms or a mild illness from which you will make a full recovery.
- If you develop more severe symptoms or your recovery is delayed, this may be a sign that you are developing a more significant chest infection that requires enhanced care, and our advice remains that if you feel your symptoms are worsening or if you are not getting better you are recommended to contact the NHS on 111 (or a local alternative), or your maternity unit, straight away for further information and advice.

2.2 Advice regarding social distancing and self-isolation

The UK Government has decided that, given the limited information currently available about how COVID-19 could affect pregnancy, it would be prudent for pregnant women to stringently engage with social distancing measures to reduce the risk of infection.

All pregnant women, regardless of gestation, should observe the social distancing guidance available on the Government website. Advice includes the avoidance of contact with people who are known to have COVID-19 or those who exhibit possible symptoms:

- [For all vulnerable people including pregnant women](#)¹⁴
- [For individuals and households of individuals with symptoms of new continuous cough or fever](#)¹⁵

Women above 28 weeks' gestation are recommended to be particularly attentive to social distancing and minimising contact with others.

[Major new measures](#) have been announced for people at highest risk from coronavirus. This includes pregnant women with significant heart disease (congenital or acquired).¹⁶

Specific recommendations regarding going to work have been published separately on the [RCOG website](#).

2.3 Advice regarding your appointments or urgent visits to clinics and hospitals

If you are well at the moment and have had no complications in your previous pregnancies, the following practical advice may be helpful:

- If you have a routine scan or visit due in the coming days, please contact your maternity unit for advice and to agree a plan. You may still be advised to attend for a visit but the appointment may change due to staffing requirements.
- If you are between appointments, please wait to hear from your maternity team.

If you are attending more regularly in pregnancy, then your maternity team will be in touch with plans for further appointments, as required.

Whatever your personal situation please consider the following:

- Maternity care is essential, and has been developed over many years to reduce complications in mothers and babies. The risks of not attending antenatal care include harm to you, your baby or both of you, even in the context of coronavirus. It is important that you keep in contact with your maternity team and continue to attend your scheduled routine care when you are well.

- If you have any concerns, please contact your maternity team as usual but please note they may take longer than usual to get back to you.
- If you have an urgent problem related to your pregnancy but not related to coronavirus, get in touch using the same emergency contact details you already have. Please do not contact this number unless you have an urgent problem.
- If you have symptoms of COVID-19, please contact your maternity team and they will arrange the right place and time to come for your visits. You should not attend a routine clinic.
- You will be asked to come alone to clinical appointments, or keep the number of people with you to one (including midwifery visits in your home).
- There may be a need to reduce the number of antenatal visits you have. This will be communicated with you, and will be done as safely as possible, taking into account available evidence on the safe number of visits required. Please do not reduce your number of visits without agreeing so first with your maternity team.

At this time, it is particularly important that you help your maternity team take care of you. If you have had an appointment cancelled or delayed, and are not sure of your next contact with your maternity team, please let them know by using the contact numbers provided to you at booking.



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3. Advice for all midwifery and obstetric services caring for pregnant women

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3.1 General advice regarding the continued provision of antenatal and postnatal services

The situation is currently moving very fast and reconfiguration of services is likely to be necessary. At present, the following is recommended:

- Antenatal and postnatal care is based on years of evidence to keep mothers and babies safe in pregnancy and birth. The majority of antenatal and postnatal care should therefore be regarded as essential care and women should be encouraged to attend, despite being advised to otherwise engage with social distancing measures.
- Women should be advised to attend routine antenatal care unless they meet current self-isolation [guidance for individuals and households of individuals with symptoms of new continuous cough or fever](#).¹⁵ Maternity care has been shown repeatedly to be essential, and studies in the UK and internationally have shown that if women do not attend antenatal services they are at increased risk of maternal death, stillbirth, and other adverse perinatal outcomes.^{17,18}
- Units should rapidly seek to adopt teleconferencing and videoconferencing capability and consider what appointments can be conducted remotely. We hope to issue further guidance on this soon. The [NHS has provided guidance](#) on the relaxation of information governance requirements for video calling.
- Recordkeeping remains paramount.
- Electronic record systems should be used and, where remote access for staff or patients is an available function, this should be expedited. When seeing women face-to-face, simultaneous electronic documentation will facilitate future remote consultation.
- Units should appoint a group of clinicians to coordinate care for women forced to miss appointments due to self-isolation. Women should be able to notify the unit of their self-isolation through telephone numbers that are already available to them. Appointments should then be reviewed for urgency and either converted to remote appointments, attendance appropriately advised or deferred.

- [For women who have had symptoms, appointments can be deferred until 7 days after the start of symptoms, unless symptoms \(aside from persistent cough\) persevere.](#)
- [For women who are self-isolating because someone in their household has possible symptoms of COVID-19, appointments should be deferred for 14 days.](#)
- Units should have a system to flag women who have missed serial appointments, which is a particular risk for women with small children who may become repeatedly unwell. Any woman who has a routine appointment delayed for more than 3 weeks should be contacted.
- Pregnant women will continue to need at least as much support, advice, care and guidance in relation to pregnancy, childbirth and early parenthood as before the pandemic.
- It is important that care is available to ensure continued support for women with multiple complex needs. Women living with adversity including poverty, homelessness, substance misuse, being an asylum seeker, experiencing domestic abuse and mental health problems will continue to require timely expert support.
- Isolation, bereavement, financial difficulties, insecurity and inability to access support systems are all widely recognised risk factors for mental ill-health. The coronavirus epidemic increases the risk of perinatal anxiety and depression, as well as domestic violence.¹⁹ It is critically important that support for women and families is strengthened as far as possible; that women are asked about mental health at every contact; and that women are urged to access support through remote means as far as possible.
- Individualised plans for women requiring frequent review may be necessary.

3.2 General advice regarding possible service modifications during COVID-19

Service modifications may be indicated to assist women with practicing recommended social distancing measures, to reduce the risk of transmission between women, staff and other clinic/hospital visitors and to provide care to women who are self-isolating for suspected/confirmed COVID-19.

Units should identify areas where there are clear possibilities for rationalisation of services.

Particular possibilities include reducing induction of labour for indications that are not strictly necessary. For example, for reduced fetal movements or before 41 weeks in healthy low risk women.^{20,21} Consideration should

also be given to routine growth scans where this is not for a strict guidance-based indication. It may be possible to improve outpatient provision of induction of labour, depending on availability of transport to hospital.

We are developing, together with a wide range of co-authors, a series of guidance documents to assist maternity units with changes to services that they provide, which may occur during the COVID-19 pandemic. These are available on the [RCOG website](#) and include:

- Guidance for early pregnancy services
- Guidance for antenatal and postnatal services
- Guidance for antenatal screening (including screening ultrasound)
- Guidance for fetal medicine services
- Guidance for maternal medicine clinics
- Guidance for self-monitoring of blood pressure in pregnancy (for women with hypertensive disorders of pregnancy)

3.3 General advice regarding intrapartum services

- Intrapartum services should be provided in a way that is safe, with reference to minimum staffing requirements and the ability to provide emergency obstetric, anaesthetic and neonatal care where needed.
- Women should be permitted and encouraged to have a birth partner present with them in their labour and during birth. A single, asymptomatic birth partner should be permitted to stay with the woman, at a minimum, through labour and birth, unless the birth occurs under general anaesthetic. Having a trusted birth partner present throughout labour is known to make a significant difference to the safety and well-being of women in childbirth.²²⁻²⁴
 - On attendance to the maternity unit, all birth partners should be asked whether they have had any symptoms which could suggest COVID-19 in the preceding seven days. If the onset of these symptoms was seven days or less ago, or they still have symptoms (other than persistent cough), they should be asked to leave the maternity unit immediately and self-isolate at home.

- The symptoms to ask about are: fever, acute persistent cough, hoarseness, nasal discharge/congestion, shortness of breath, sore throat, wheezing or sneezing.
- Birth partners who are not symptomatic of COVID-19 may be asked to remain by the woman's bedside, not walk around the ward/hospital and should be given clear advance guidance on what is expected of them if they accompany the woman to the operating theatre (e.g. for Caesarean section). This is particularly important given the known challenges of staff communication when wearing full PPE.
- Restrictions on other visitors, such as limiting the number of birth partners to one, restricting any or all visitors to antenatal or postnatal wards (to ensure compliance with social distancing measures), and preventing swapping and postnatal visitors, should follow hospital policy.
- The evidence for the safety of birth settings that are not co-located with an obstetric unit is based on the availability of ambulance services to enable rapid transfer, and appropriate staffing levels.²⁵ If these are not in place, it may be reasonable to rationalise the provision of these services.

3.4 Smoking cessation and carbon monoxide monitoring in pregnancy

Smoking is very likely to be associated with worse outcomes for COVID-19, although presently available research cannot accurately estimate the effect. It is therefore particularly important to emphasise the need to stop smoking as soon as possible to all women.²⁶

The National Centre for Smoking Cessation and Training (NCSCT) has recommended the suspension of monitoring carbon monoxide during pregnancy, as a precautionary measure following concern about the risk of coronavirus transmission. Other aspects of care targeted to identify smokers and assist with cessation should still continue. [Further guidance is available.](#)

3.5 Maternal mental wellbeing

This pandemic will inevitably result in an increased amount of anxiety in the general population, and this is likely to be even more so for pregnant women as it represents an additional period of uncertainty. Specifically, these anxieties are likely to revolve around:

- COVID-19 itself.
- The impact of social isolation resulting in reduced support from wider family and friends.
- The potential of reduced household finances.
- Major changes in ante-natal and other NHS care with appointments being changed from face-to-face to telephone contact.

The change in appointment style will also make assessment for women experiencing domestic violence, women with safeguarding concerns and women who are misusing substances more difficult.

A general increase in anxiety is to be expected in the current situation. Often simply acknowledging these difficulties can help to contain some of these anxieties. This can be facilitated by maintaining access to midwifery services, accessing [sources of self-help for anxiety and stress](#), and when necessary [self-referral](#) to local IAPT (Improving Access to Psychological Therapies) services in England or equivalents in other nations.

Further information is available from the [RCPsych website](#).



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4. Advice for services caring for women with suspected or confirmed COVID-19

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The following advice refers mostly to the care of women in the second or third trimesters of pregnancy.

Care of women in the first trimester should include attention to the same infection prevention and investigation/diagnostic guidance.

Specific advice regarding the acute care of pregnant women admitted with moderate or severe symptoms of COVID-19 can be found in section 4.7.1.

4.1 General advice for services providing care to pregnant women

The following suggestions apply to all hospital/clinic attendances for women with suspected or confirmed COVID-19:

- Women should be advised to attend via private transport where possible or call 111/999 for advice as appropriate.
- If an ambulance is required, the woman should alert the call handler that she is currently in self-isolation for possible or confirmed COVID-19.
- Women should be asked to alert a member of maternity staff to their attendance when on the hospital premises, by telephone prior to entering the hospital.
- Staff providing care should take personal protective equipment (PPE) precautions as per local [health protection guidance](#).²⁷
- Women should be met at the maternity unit entrance by staff wearing appropriate PPE and be provided with a surgical face mask (not a filtering face piece level 3 (FFP3) mask). The face mask should not be removed until the woman is isolated in a suitable room.
- Women should immediately be escorted to an isolation room or cohort bay/ward, suitable for the majority of care during their hospital visit or stay.

- Isolation rooms or ward bays should ideally have a defined area for staff to put on and remove PPE, and ensuite bathroom facilities.
- Further advice on care in isolation rooms versus COVID-19 cohort bays is available from [PHE](#).
- Only essential staff should enter the room and visitors should be kept to a minimum.
- Remove non-essential items from the clinic/scan room prior to the woman arriving there.
- All clinical areas used will need to be cleaned after use as per [health protection guidance](#).²⁷

4.2 Women presenting for care with unconfirmed COVID-19 but symptoms suggestive of possible infection

Maternity departments with direct entry for patients and the public should have a system in place for identifying potential cases as soon as possible, to prevent potential transmission to other patients and staff. This should be at first point of contact (either near the entrance or at reception) to ensure early recognition and infection control. This should be employed before a patient takes a seat in the maternity waiting area.

Services should follow guidance available from the NHS about whether the woman is at risk of COVID-19. If a woman meets [PHE criteria](#) for COVID-19 testing, she should be tested. Current criteria (correct at the time of publishing this update) is:

Women who are being/are admitted to hospital with one of the following:

- Clinical/radiological evidence of pneumonia.
- Acute Respiratory Distress Syndrome (ARDS).
- Fever ≥ 37.8 AND at least one of acute persistent cough, hoarseness, nasal discharge/congestion, shortness of breath, sore throat, wheezing or sneezing.

Furthermore, we recommend that women with an isolated fever should be investigated and treated according to the unit protocol. This will include sending a full blood count. If lymphopenia is identified on the full blood count, testing for COVID-19 should be arranged.

Until test results are available, the woman should be treated as though she has confirmed COVID-19. The full [Public Health England guidance](#) has been summarised in a flowchart for this guideline (Appendix 1).²⁸

Women may attend hospital for reasons directly related to pregnancy and also have coincidental symptoms meeting the COVID-19 case definition. In cases of uncertainty, seek additional advice or in case of emergency, investigate and treat as suspected COVID-19 until advice can be sought. Suspected COVID-19 should not delay administration of therapy that would be usually given (for example, IV antibiotics in woman with fever and prolonged rupture of membranes).

In the event of a pregnant woman attending with an obstetric emergency and being suspected or confirmed to have COVID-19, maternity staff must first follow IPC guidance. This includes transferring the woman to an isolation room and donning appropriate PPE. This can be time consuming and stressful for patients and health professionals. Once IPC measures are in place, the obstetric emergency should be dealt with as the priority. Do not delay obstetric management in order to test for COVID-19.

Further care, in all cases, should continue as for a woman with confirmed COVID-19, until a negative test result is obtained.

4.3 Attendance for routine antenatal care in women with current suspected or confirmed COVID-19

Routine appointments for women with suspected or confirmed COVID-19 (growth scans, oral glucose tolerance test, antenatal community or secondary care appointments) should be delayed until after the recommended period of self-isolation. Advice to attend more urgent pre-arranged appointments (fetal medicine surveillance, high risk maternal secondary care) will require a senior decision on urgency and potential risks/benefits.

Trusts/boards are advised to arrange local, robust communication pathways for senior maternity staff members to screen and coordinate appointments missed due to suspected or confirmed COVID-19.

If it is deemed that obstetric or midwifery care cannot be delayed until after the recommended period of isolation, infection prevention and control measures should be arranged locally to facilitate care. Pregnant women in self-isolation who need to attend should be contacted by a local care coordinator to re-book urgent appointments / scans, preferably at the end of the working day.

If ultrasound equipment is used, this should be decontaminated after use in line with [national guidance](#).

4.4 Attendance for unscheduled/urgent antenatal care in women with suspected or confirmed COVID-19

When possible, early pregnancy units (EPUs) or maternity triage units should provide advice over the telephone. If this requires discussion with a senior member of staff who is not immediately available, a return call should be arranged.

Local protocols are required to ensure women with confirmed or suspected COVID-19 are isolated on arrival to EPUs or maternity triage units and full PPE measures are in place for staff (see Section 4.1).

Medical, midwifery or obstetric care should otherwise be provided as per routine.

4.5 Women who develop new symptoms of COVID-19 during admission (antenatal, intrapartum or postnatal)

There is an estimated incubation period of 0-14 days (mean 5-6 days); an infected woman may therefore present asymptotically, developing symptoms later during an admission.²⁹

Health professionals should be aware of this possibility, particularly those who regularly measure patient vital signs (e.g. healthcare assistants). In the event of new onset of respiratory symptoms with/without unexplained fever, which meet the PHE case-definition for suspected COVID-19 (section 4.2), the woman should be isolated and appropriate infection control precautions initiated in line with [UK Infection Prevention and Control Guidance](#). The local Infection Prevention and Control team should also be notified.

Furthermore, we recommend that women with an isolated fever should be investigated and treated according to the unit's protocol. This will include sending a full blood count. If lymphopenia is identified on the full blood count, or the woman has other symptoms suggestive of COVID-19, testing for COVID-19 should be considered.

It is recognised that this may lead to substantial numbers of women treated as suspected COVID-19. Suspected COVID-19 should not delay administration of therapy that would be usually given (for example, IV antibiotics in woman with fever and prolonged rupture of membranes).

Recommended care for women who have moderate to severe symptoms of COVID-19 during pregnancy is covered in section 4.7.1.

4.6 Women attending for intrapartum care with suspected or confirmed COVID-19

4.6.1 Attendance in labour

All women should be encouraged to call the maternity unit for advice in early labour. Women with mild COVID-19 symptoms can be encouraged to remain at home (self-isolating) in early (latent phase) labour as per standard practice.

If homebirth or birth in a midwifery-led unit is planned, a discussion should be initiated with the woman regarding the potentially increased risk of fetal compromise if infected with COVID-19.³ The woman should be advised to attend an obstetric unit for birth, where the baby can be monitored using continuous electronic fetal monitoring (EFM). This guidance may change as more evidence becomes available.

When a woman decides to attend the maternity unit, general recommendations about hospital attendance apply (see section 4.1).

Once settled in an isolation room, a full maternal and fetal assessment should be conducted to include:

- Assessment of the severity of COVID-19 symptoms by a multidisciplinary team (MDT), including an infectious diseases or general medical specialist.
- Maternal observations including temperature, respiratory rate and oxygen saturations.
- Confirmation of the onset of labour, as per standard care.
- EFM using cardiotocograph (CTG).
 - In two Chinese case series, including a total of 18 pregnant women infected with COVID-19 and 19 babies (one set of twins), there were eight reported cases of fetal compromise.^{3,6} Given this relatively high rate of fetal compromise, continuous EFM in labour is currently recommended for all women with COVID-19.
- If the woman attends with a fever, investigate and treat as per [RCOG guidance](#) on sepsis in pregnancy, but also consider active COVID-19 as a cause of sepsis and investigate according to [PHE guidance](#) (see section 4.2 for COVID-19 case definition).

If there are no concerns regarding the condition of either the mother or baby, women who would usually be advised to return home until labour is more established, can still be advised to do so, if appropriate transport is available.

Women should be given the usual advice regarding signs and symptoms to look out for, but in addition should be told about symptoms that might suggest deterioration related to COVID-19 following consultation with the medical team (e.g. difficulty in breathing).

If labour is confirmed, then care in labour should ideally continue in the same isolation room.

4.6.2 Care in labour

The following considerations apply to women in spontaneous or induced labour:

- When a woman with confirmed or suspected COVID-19 is admitted to the delivery suite, the following members of the MDT should be informed: consultant obstetrician, consultant anaesthetist, midwife-in-charge, consultant neonatologist, neonatal nurse in charge and infection control team.
- Efforts should be made to minimise the number of staff members entering the room and units should develop a local policy specifying essential personnel for emergency scenarios.
- There is evidence of household clustering and household co-infection.³⁰ Asymptomatic birth partners should be asked to wash their hands frequently. If symptomatic, birth partners should remain in self-isolation and not attend the unit. Women should be advised to identify an alternative birth partner, should the need arise.
- Maternal observations and assessment should be continued as per standard practice, with the addition of hourly oxygen saturations.
 - Aim to keep oxygen saturation more than 94%, titrating oxygen therapy accordingly.
- If the woman develops a fever, investigate and treat as per [RCOG guidance](#) on sepsis in pregnancy, but also consider active COVID-19 as a cause of sepsis and investigate according to [PHE guidance](#) (see section 4.2 for COVID-19 case definition).
- Given the rate of fetal compromise reported in the two Chinese case series,^{3,6} the current

recommendation is for continuous electronic fetal monitoring in labour:

- There is currently no evidence to favour one mode of birth over another and therefore mode of birth should be discussed with the woman, taking into consideration her preferences and any obstetric indications for intervention. Mode of birth should not be influenced by the presence of COVID-19, unless the woman's respiratory condition demands urgent delivery.
 - At present, where vaginal secretions have been tested for COVID-19, the results have been negative.
- The use of birthing pools in hospital should be avoided in suspected or confirmed cases, given the inability for healthcare staff to use adequate waterproof PPE and the risk of infection via faeces.
- There is no evidence that epidural or spinal analgesia or anaesthesia is contraindicated in the presence of coronaviruses. Epidural analgesia should therefore be recommended in labour, to women with suspected or confirmed COVID-19 to minimise the need for general anaesthesia if urgent delivery is needed.
- There is no evidence that the use of Entonox is an aerosol-generating procedure (AGP).
- Entonox should be used with a single-patient microbiological filter. This is standard issue throughout maternity units in the UK.
- In case of deterioration in the woman's symptoms, refer to Section 4.7 for additional considerations, and make an individual assessment regarding the risks and benefits of continuing the labour versus proceeding to emergency caesarean birth if this is likely to assist efforts to resuscitate the woman.
- When caesarean birth or other operative procedure is advised, follow guidance from Section 4.9.2.
 - For emergency caesarean births, donning PPE is time-consuming. This may impact on the decision to delivery interval but it must be done. Women and their families should be told about this possible delay.
- An individualised decision should be made regarding shortening the length of the second stage of labour with elective instrumental birth in a symptomatic woman who is becoming exhausted or hypoxic.

- Given a lack of evidence to the contrary, delayed cord clamping is still recommended following birth, provided there are no other contraindications. The baby can be cleaned and dried as normal, while the cord is still intact.

4.6.3 Specific advice regarding Personal Protective Equipment for Labour

General advice from PHE on type and specification of PPE is [available here](#). Particular advice from Public Health England on type and specification of PPE for maternity settings is available as part of the [table here](#).

Caesarean birth: specific advice on PPE when caring for pregnant women with suspected/confirmed COVID-19 requiring Caesarean birth is detailed in section 4.9.

4.6.4 Elective caesarean birth

Where women with suspected or confirmed COVID-19 have scheduled appointments for pre-operative care and elective caesarean birth, an individual assessment should be made to determine whether it is safe to delay the appointment to minimise the risk of infectious transmission to other women, healthcare workers and, postnatally, to her infant.

In cases where elective caesarean birth cannot safely be delayed, the general advice for services providing care to women admitted when affected by suspected/confirmed COVID-19 should be followed (see Section 4.1), as should the advice on PPE for caesarean birth (see section 4.9).

Obstetric management of elective caesarean birth should be according to usual practice.

4.6.5 Planned induction of labour

As for elective caesarean birth, an individual assessment should be made regarding the urgency of planned induction of labour for women with mild symptoms and suspected or confirmed COVID-19. If induction of labour cannot safely be delayed, the general advice for services providing care to women admitted to hospital when affected by suspected/confirmed COVID-19 should be followed (see Section 4.1). Women should be admitted into an isolation room; in which they should ideally be cared for the entirety of their hospital stay.

4.7 Additional considerations for women with confirmed COVID-19 and moderate/severe symptoms

The following recommendations apply in addition to those specified for women with no or mild symptoms.

4.7.1 Women admitted antenatally

When pregnant women are admitted to hospital with deterioration in symptoms and suspected or confirmed COVID-19 infection, the following recommendations apply:

- A MDT discussion planning meeting ideally involving a consultant physician (infectious disease specialist where available), consultant obstetrician, midwife-in-charge and consultant anaesthetist responsible for obstetric care should be arranged as soon as possible following admission. The discussion and its conclusions should be discussed with the woman. The following should be included:
 - Key priorities for medical care of the woman.
 - Most appropriate location of care (e.g. intensive care unit, isolation room in infectious disease ward or other suitable isolation room) and lead specialty.
 - Concerns among the team regarding special considerations in pregnancy, particularly the condition of the baby.
- The priority for medical care should be to stabilise the woman's condition with standard supportive care therapies.
 - A useful summary on supportive care for adults diagnosed with COVID-19 has been published by the [World Health Organisation \(WHO\)](#).³¹
 - Specific guidance on the [management of patients with COVID-19 who are admitted to critical care](#) has now been published by NICE.³²
- Particular considerations for pregnant women are:
 - Hourly observations, looking for the number and trends.
 - Hourly respiratory rate looking for the rate and trends.

- Young fit women can compensate for a deterioration in respiratory function and are able to maintain normal oxygen saturations before they then suddenly decompensate. So a rise in the respiratory rate, even if the saturations are normal, may indicate a deterioration in respiratory function and should be managed by starting or increasing oxygen.
- o Titrate oxygen to keep saturations >94%.
- o Radiographic investigations should be performed as for the non-pregnant adult; this includes chest X-ray and computerised tomography (CT) of the chest. Chest imaging, especially CT chest, is essential for the evaluation of the unwell patient with COVID-19 and should be performed when indicated, and not delayed because of fetal concerns.³³⁻³⁵ Abdominal shielding can be used to protect the fetus as per normal protocols.
- o Consider additional investigations to rule out differential diagnoses e.g. ECG, CTPA as appropriate, echocardiogram. Do not assume all pyrexia is due to COVID-19 and also perform full sepsis-six screening.
- o Consider bacterial infection if the white blood cell count is raised (lymphocytes usually normal or low with COVID-19) and commence antibiotics.
- o Apply caution with IV fluid management. Try boluses in volumes of 250-500mls and then assess for fluid overload before proceeding with further fluid resuscitation.³¹
- o The frequency and suitability of fetal heart rate monitoring should be considered on an individual basis, taking into consideration the gestational age of the fetus and the maternal condition. If urgent delivery is indicated for fetal reasons, birth should be expedited as normal, as long as the maternal condition is stable.
- o If maternal stabilisation is required before delivery, this is the priority, as it is in other maternity emergencies, e.g. severe pre-eclampsia.
- o An individualised assessment of the woman should be made by the MDT to decide whether elective birth of the baby is indicated, either to assist efforts in maternal resuscitation or where there are serious concerns regarding the fetal condition. Individual assessment should consider: the maternal condition, the fetal condition, the potential for improvement following elective birth and the gestation of the pregnancy. The priority must always be the wellbeing of the mother.

- There is no evidence to suggest that steroids for fetal lung maturation, when they would usually be offered, cause any harm in the context of COVID-19. Steroids should therefore be given when indicated, and certainly prior to 30 weeks, where even one dose may benefit the neonate. As per standard practice, urgent delivery should not be delayed for their administration.

There are some reports that even after a period of improvement there can be a rapid deterioration. Following improvement in a woman's condition, consider an ongoing period of observation, where possible, for a further 24-48 hours. On discharge, advise the woman to return immediately if she becomes more unwell.

4.7.2 Women requiring intrapartum care

In addition to recommendations in Sections 4.8 and 4.9.1, for women with moderate or severe COVID-19 requiring intrapartum care it is also recommended that:

- The neonatal team should be informed of plans for the birth of the baby of a woman affected by moderate to severe COVID-19 as far in advance as possible and should also be given sufficient notice at the time of birth, to allow them to attend and don PPE before entering the room/theatre.
- With regard to mode of birth, an individualised decision should be made, with no obstetric contraindication to any method except water birth (see above). Caesarean birth should be performed if indicated based on maternal and fetal condition as in normal practice.
- Given the association of COVID-19 with acute respiratory distress syndrome,³⁶ women with moderate to severe symptoms of COVID-19 should be monitored using hourly fluid input/output charts. Efforts should be targeted towards achieving neutral fluid balance in labour, in order to avoid the risk of fluid overload.

4.8 Postnatal management

4.8.1 Neonatal care

There are limited data to guide the postnatal management of babies of mothers who tested positive for COVID-19 in the third trimester of pregnancy. Literature from China has advised separate isolation of the infected mother and her baby for 14 days. However, routine precautionary separation of a mother and a healthy baby should not be undertaken lightly, given the potential detrimental effects on feeding and bonding. Given the current limited evidence, we advise that women and healthy infants, not otherwise requiring neonatal care, are kept together in the immediate postpartum period.

A risk and benefits discussion with neonatologists and families to individualise care in babies that may be more susceptible is recommended. We emphasise that this guidance may change as knowledge evolves.

All babies born to COVID-19 positive mothers should be cared for as per [RCPCH guidance](#).³⁷

4.8.2 Infant feeding

It is reassuring that in six Chinese cases, breastmilk tested negative for COVID-19;³ however, given the small number of cases, this evidence should be interpreted with caution. The main risk of breastfeeding is the close contact between the infant and the mother, who is likely to share infective droplets. In the light of the current evidence, we advise that the benefits of breastfeeding outweigh any potential risks of transmission of the virus through breastmilk. The risks and benefits of breastfeeding, including the risk of holding the baby in close proximity, should they be infected, should be discussed with the parents. This guidance may change as knowledge evolves.

The following precautions should be taken to limit viral spread to the baby:

- Wash hands before touching the baby, breast pump or bottles.
- Avoid coughing or sneezing on the baby while feeding.
- Consider wearing a face mask, if available, while feeding or caring for the baby.
- Where a breast pump is used, follow recommendations for pump cleaning after each use.
- Considering asking someone who is well to feed the baby.

For babies who are bottle fed with formula or expressed milk, strict adherence to [sterilisation guidelines](#) is recommended.

Where mothers are expressing breastmilk in hospital, a dedicated breast pump should be used.

4.8.3 Discharge and readmission to hospital

Any mothers or babies requiring readmission for postnatal obstetric or neonatal care during the period of self-isolation due to suspected or confirmed COVID-19 are advised to telephone ahead to contact their local unit and follow the attendance protocol as described in Section 4.1. The place of admission will depend on the level of care required for mother or baby.

4.9 Specific peri-operative advice for healthcare professionals caring for pregnant women with suspected/confirmed COVID-19 who require surgical intervention

4.9.1 General advice for obstetric/emergency gynaecology theatre

- Elective/planned obstetric procedures (e.g. cervical cerclage or Caesarean) should be scheduled at the end of the operating list.
- Non-elective procedures should be carried out in a second obstetric theatre, where available, allowing time for a full postoperative theatre clean as per local [health protection guidance](#).²⁷
- The number of staff in the operating theatre should be kept to a minimum, and all must wear [appropriate PPE](#).
- All staff (including maternity, neonatal and domestic) should have been trained in the use of PPE so that 24-hour emergency theatres are available and possible delays reduced.
- Anaesthetic management for women with symptoms or confirmed COVID-19 should be with reference to [anaesthetic guidance](#).
- Departments should consider running dry-run simulation exercises to prepare staff, build confidence and identify areas of concern to prepare for emergency transfers to the operating theatre.

4.9.2 Advice regarding Personal Protective Equipment for Caesarean birth

Caesarean birth: the level of PPE required by healthcare professionals caring for a woman with COVID-19 who is undergoing a caesarean birth should be determined based on the risk of requiring a general anaesthetic (GA). Intubation for a GA is an AGP. This significantly increases the risk of transmission of coronavirus to the attending staff. Regional anaesthesia (spinal, epidural or CSE) is not an AGP.

For the minority of caesarean births, where GA is planned from the outset, all staff in theatre should wear PPE, with a FFP3 mask. The scrub team should scrub and don PPE before the GA is commenced.

For a non-urgent caesarean birth where regional anaesthesia is planned, the risk of requiring a GA is very small, as there is no time pressure. In this situation, all staff not required for siting of the regional anaesthetic should stay outside theatre until the block is effective.

The chance of requiring conversion to a GA during a caesarean birth commenced under regional anaesthesia is small, but this chance increases with the urgency of caesarean birth. In situations where there are risk factors that make conversion to a GA more likely, the decision on what type of PPE to wear should be judged based on the individual circumstances. If the risk of requiring conversion to a GA is considered significant, the theatre team should wear PPE appropriate to a GA in readiness. An example is a woman whose epidural has been suboptimal during labour, which is 'topped-up' for an emergency caesarean birth.

These recommendations will be updated as required as further evidence and advice becomes available.



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**5. Advice for services
caring for women
following isolation for
symptoms, or recovery
from confirmed
COVID-19**

5. Advice for services caring for women following isolation for symptoms, or recovery from confirmed COVID-19

5.1 Antenatal care for pregnant women following self-isolation for symptoms suggestive of COVID-19

Scheduled antenatal care that falls within the self-isolation period should be rearranged for post-isolation. No additional tests, including ultrasound assessment of fetal growth, are necessary for women not requiring hospitalisation for COVID-19.

Even if a woman has previously tested negative for COVID-19, if she re-presents with symptoms that meet the case definition (section 4.2), COVID-19 should be suspected.

5.2 Antenatal care for pregnant women following hospitalisation for confirmed COVID-19 illness

For those recovering after acute illness, further antenatal care should be arranged for after the period of self-isolation.

Referral to antenatal ultrasound services for fetal growth surveillance is [recommended](#) 14 days after resolution of acute illness. Although there is no evidence yet that fetal growth restriction (FGR) is a risk of COVID-19, two-thirds of pregnancies with SARS were affected by FGR and a placental abruption occurred in a MERS case, so ultrasound follow-up seems prudent.^{38,39}

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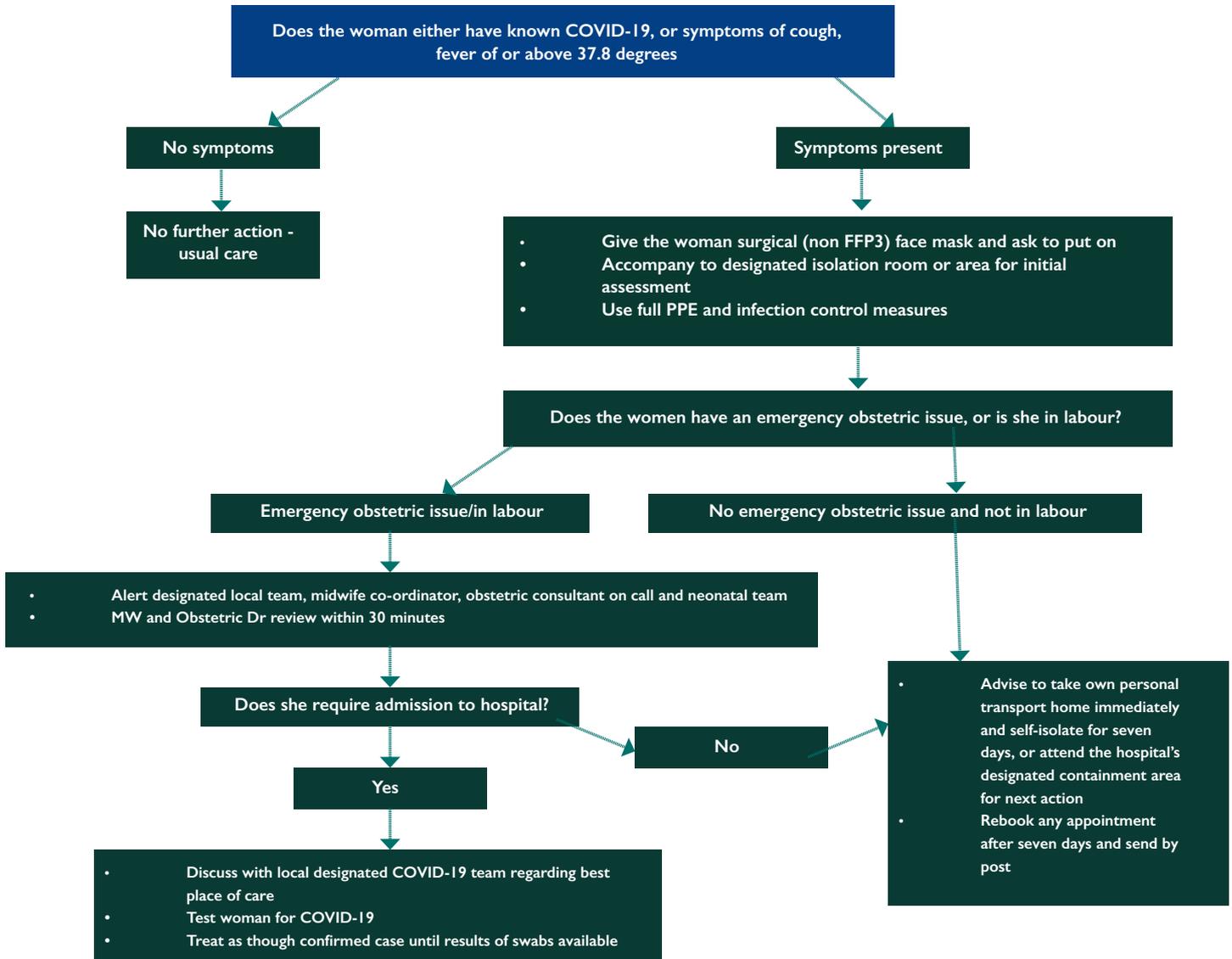


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Appendix

Appendix I: Flow chart to assess COVID-19 risk in maternity unit attendees

Derived from Royal London flowchart developed by Dr Misha Moore



Appendix 2: Summary of updates

Version	Date	Summary of changes
2	12.3.20	1.2: At the time of writing, Public Health Wales are aligning with Public Health England on case definitions, assessment, infection prevention and control and testing. We will update this guidance if this changes.
2	13.3.20	2.2: Updated to reflect PHE and health protection advice as per 13.03.20, in particular to use online symptom checkers and to treat all individuals with symptoms as possibly having COVID-19
2	13.3.20	3.2: Sentence on who to test updated to reflect advice to test women with symptoms suggestive of COVID-19 who require admission
2	13.3.20	3.6.4 and 3.6.5: Updated to suggest considering delay of elective caesarean birth or induction for women with symptoms suggestive of COVID-19 as well as those with confirmed COVID-19
2	13.3.20	3.8: Infant feeding modified from recommendation to wear a face mask to try and avoid coughing or sneezing on the baby, and consider wearing face mask where available
2	13.3.20	4: New section added for antenatal care for pregnant women following self-isolation for symptoms suggestive of COVID-19
2	13.3.20	5 (new). New section - Advice for pregnant healthcare professionals
2	13.3.20	Appendix 1: Flow chart amended to reflect modified PHE guidance

2	13.3.20	References: 19. NHS Staff Council Statement on Covid-19 2020 [Available from: https://www.nhsemployers.org/-/media/Employers/Documents/Pay-and-reward/NHS-Staff-Council---Guidance-for-Covid-19-Feb-20.pdf?la=en&hash=70C909DA995280B9FAE4BF6AF291F4340890445C] accessed 12 March 2020
3	17.3.20	2: Advice for Health Professionals to share with Pregnant Women updated to reflect current guidelines
3	17.3.20	3: New section added on Advice for all midwifery and obstetric services
3	17.3.20	4.1: General advice to services providing care to pregnant women updated to reflect advice from chief medical officer on 16/3/20
3	14.3.20	4.1: Advice on cleaning ultrasound equipment added, and reference added
3	17.3.20	4.5: Linked to new national guidance on the actions required when a COVID-19 case was not diagnosed on admission
3	17.3.20	4.6.2: Recommendations added: There is evidence of household clustering and household co-infection. Asymptomatic birth partners should be treated as possibly infected and asked to wear a mask and wash their hands frequently. If symptomatic, birth partners should remain in isolation and not attend the unit. The use of birthing pools in hospital should be avoided in suspected or confirmed cases, given evidence of transmission in faeces and the inability to use adequate protection equipment for healthcare staff during water birth.

3	17.3.20	4.6.2: Advice about Entonox changed to There is no evidence that the use of Entonox is an aerosol-prone procedure Entonox should be used with a single-patient microbiological filter. This is standard issue throughout maternity units in the UK.
3	17.3.20	4.6.4: Anaesthetic management for women with symptoms or confirmed COVID-19, which was previously in this guidance, has been removed and external links provided
3	17.3.20	4.7.1: Statement inserted 'Chest imaging, especially CT chest, is essential for the evaluation of the unwell patient with COVID-19 and should be performed when indicated and not delayed due to fetal concerns.'
3	17.3.20	Updated to reflect current public health guidance on self-isolation and social distancing
3	17.3.20	4.7.1: Advice on neonatal management and testing has been removed. Please refer to RCPCH guidance
3	17.3.20	6: Advice for healthcare professionals updated in line with Chief Medical Officer statement on Monday 16 March.
4	21.3.20	6: Section on 'Occupational health advice for employers and pregnant women during the COVID-19 pandemic' added, replacing the previous section 6 on 'Information for Healthcare Professionals'. Section includes specific recommendations for healthcare professionals.

4	21.3.20	1.3-1.4: Additional information added on the susceptibility of pregnant women to COVID-19 infection.
4	21.3.20	2: Additional information on social distancing for pregnant women added, particularly specifying stringent adherence to recommendations for women >28 weeks gestation.
4	21.3.20	4.7: New section added on specific recommendations for PPE during labour and birth
4	21.3.20	1: Addition of information and links for the UKOSS reporting system
4	21.3.20	All: General proofread and editorial changes
4	21.3.20	6: Page 36 title changed to 'Occupational health advice for employers and pregnant women during the COVID-19 pandemic'
4.1	26.3.20	Chapter 6: 'Occupational health advice for employees and pregnant women during the COVID-19 pandemic' has been removed from this general guidance on pregnancy and COVID-19 infection, and published as a separate document given the distinct audience for the occupational health advice.
4.1	26.3.20	4.7.3: On Personal Protective Equipment updated in line with NHS England guidance

5	28.3.20	1.3: Section updated to include new evidence on possible vertical transmission
5	28.3.20	2.2: Sentence added on the major new measures announced by government for pregnant women with co-existing significant congenital or acquired heart disease.
5	28.3.20	2.3: Section updated to emphasise the need to attend maternity care
5	28.3.20	3: General advice for antenatal care extended to include considerations for vulnerable women. Section also added on general advice regarding intrapartum services
5	28.3.20	3.1: Specific advice added regarding the cessation of carbon monoxide monitoring in pregnancy, following advice from the National Centre for Smoking Cessation and Training.
5	28.3.20	4: Scotland specific links to Health Protection Scotland removed after confirmation from the Scottish government that National links from gov.uk should be used.
5	28.3.20	4.3.6: Scotland specific links to Health Protection Scotland removed after confirmation from the Scottish government that National links from gov.uk should be used.
5	28.3.20	4.7.3 and 4.7.6: Advice on PPE considerations for Caesarean birth and general advice for obstetric theatres moved to new section 'Specific peri-operative advice for pregnant women with suspected/confirmed COVID-19 requiring surgical intervention'.
5	28.3.20	4.8.1: Reference made to new guidance published by NICE on the management of patients with COVID-19 in critical care.
5	28.3.20	4.8.1: Additional recommendations made for the management of women admitted during pregnancy with suspected/confirmed COVID-19.
5	28.3.20	4.9.2: Section edited to make infant feeding recommendations to any caregiver, not just to the mother.
5	28.3.20	4.10: New section on 'Specific peri-operative advice for pregnant women with suspected/confirmed COVID-19 requiring surgical intervention'

5	28.3.20	5.1: Correction of an error in the title to clarify that this section refers to the care of women recovering from suspected (not confirmed) COVID-19 for which hospitalisation was not required.
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